Multiples

It's helpful to think about multiples and divisibility as two parts of the same idea. We know that 10 is "divisible" by 5 because when we do the division $10 \div 5$, the result 2 is a whole number. It's the fact that the result is a whole number that proves that 10 is divisible by 5.

To understand the concept of "multiples," we need to turn around our thinking about divisibility. So instead of thinking of $10 \div 5 = 2$, let's think about $2 \times 5 = 10$. This multiplication problem tells us that 10 is a "multiple" of both 2 and 5.

A multiple of a number is what we get when we multiply that number by a whole number. Here's how we get some of the multiples of 2:

$$2 \times 1 = 2$$

$$2 \times 2 = 4$$

$$2 \times 3 = 6$$

$$2 \times 4 = 8$$

$$2 \times 5 = 10$$

So 2, 4, 6, 8, and 10 are multiples of 2. And here's how we get some of the multiples of 5:

$$5 \times 1 = 5$$

$$5 \times 2 = 10$$

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$$5 \times 3 = 15$$

$$5 \times 4 = 20$$

$$5 \times 5 = 25$$

So 5, 10, 15, 20, and 25 are multiples of 5.

The multiples of 2 that we've listed here aren't the **only** multiples of 2, and the multiples of 5 that we've listed here aren't the **only** multiples of 5. They're just a few of the multiples of those numbers, to give you an idea of what a "multiple" is.

To relate multiples to divisibility, you now know two reasons why 20 is a multiple of 5:

1. 20 is a multiple of 5 because 20 is divisible by 5, since $20 \div 5$ gives a whole number answer of 4.
2. 20 is a multiple of 5 because 5 multiplied by a certain whole number, 4, gives $5 \times 4 = 20$.

Example

Is 80 a multiple of 10? If so, give two reasons why.

Yes, 80 is a multiple of 10, for two reasons:

1. 80 is a multiple of 10 because 80 is divisible by 10, since $80 \div 10$ is 8, a whole number.

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2. 80 is a multiple of 10 because 10 multiplied by a certain whole number, 8, gives $10 \times 8 = 80$.

We could think of 0 as a multiple of **any** number, because if we multiply any number by 0, we get 0. For example, we could think of the multiples of 2 as 0, 2, 4, 6, ..., which are also known as even numbers. However, there is no number that's divisible by 0, because division by 0 is never allowed!

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